Green Buildings – A Tool for Stemming Climate Change?

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Figure 1

Over the past decade, Southern California cities have adopted green building programs at a steady pace. Today, the region is a national hotbed of green building, with mandatory programs in seven Los Angeles County cities complemented by incentive-based programs in cities like Riverside and Costa Mesa.[1] As climate change rapidly moves to the center of environmental discourse, it is essential to explore how these programs factor into the climate change equation.

Functioning as an umbrella, a green building program integrates and encourages innovation in waste management, stormwater, water conservation, energy efficiency, land use, and public health. Pioneers like Santa Monica laid the foundation for folding green building into local government operations by focusing first on City building projects. This trend continued through the first part of the new millennium, with Southland cities large and small adopting green requirements for public construction.

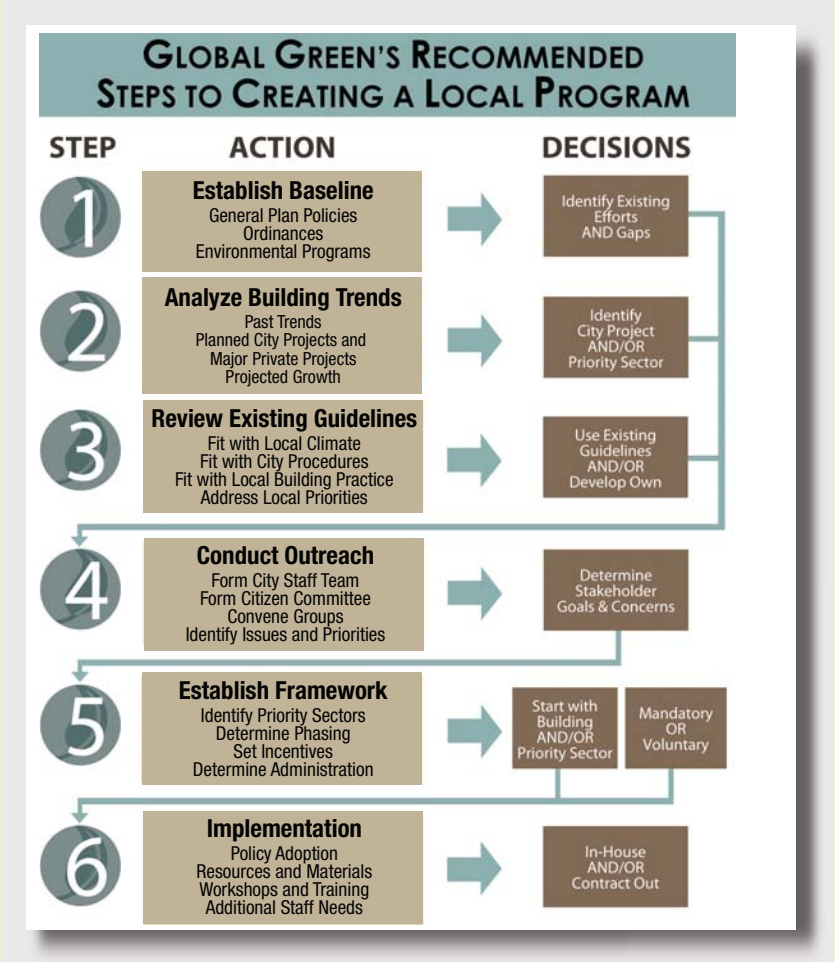
Over the past several years the trend has shifted to focus on requesting or requiring private sector development to build green.[2] Global Green worked with a number of cities - Los Angeles, Long Beach, Pasadena, Irvine, and West Hollywood – that have taken this path. Structurally, a model private sector program combines planning and building code modifications; instituting a comprehensive green building standard; and, establishing incentives such as priority processing, increased building area, or parking reductions. This basic framework is then adjusted to address the environmental, social, political, and development issues unique to each city.

Figure 2

Example Local Green Building Rating Systems

City	Thresholds	Mandatory Thresholds	Voluntary/Incentive Thresholds	Effective Date
Irvine	New Homes New Commercial Projects New Apartments		City "Green Home" Checklist City "Green Apartment Home" Checklist City "Green Building" Checklist	October 2005
Long Beach	Municipal Buildings (≥7,500 sf) Residential/Mixed Use (≥50 units) Commercial/Industrial (≥50,000 sf)	LEED Certified Intent of LEED Certified Intent of LEED Certified		June 2003 November 2007
Los Angeles	Municipal Buildings (≥7,500 sf) Non-Res./Mixed (≥50,000 sf) Res. (High-Rise, ≥50,000 sf, ≥ 50 units) Res. Renovations (≥50,000 sf/≥50 units)	LEED Certified Intent of LEED Certified Intent of LEED Certified	 LEED Silver LEED Silver LEED Silver	January 2002 April 2008
Pasadena	Municipal Buildings New (≥5,000 sf) Renovations (≥15,000 sf) Non-Res. New Construction New Construction (≥25,000 sf) New Construction (≥50,000 sf) Residential Tenant Improvements (≥25,000 sf) Multifamily (≥ 4 stories) Mixed-Use (≥ 4 stories)	 Intent of LEED Silver Intent of LEED Silver Intent of LEED Certified Intent of LEED Silver Intent of LEED Certified Intent of LEED Certified Intent of LEED Certified	 LEED Certified (affordable units) LEED Certified (affordable units) LEED Certified (affordable units)	 October 2005 (Updated May 2008)
West Hollywood	Municipal Buildings (≥10,000 sf) Private Development (all projects) Private Development (≥ 3 units)	LEED Certified WEHO Basic Green Standards WEHO Basic Green Standards WEHO Green Point System (min. 60 pts.)	 WEHO Green Point System (min. 90 pts.) WEHO Green Point System (min. 90 pts.)	April 2006 October 2007

Figure 3



In 2006, Global Green developed a six-step methodology for establishing a green building program.[3] The process begins with an analysis of existing codes, policies and programs, then reviews projections for the future type and quantity of development. Next is a series of meeting with designers, builders, environmental advocates, and other interested parties, often in the form of a "green ribbon" committee to discuss what issues are of greatest priority locally, what building types and sizes should be addressed, and how to most effectively implement the program. At this point, the program framework can be fleshed out and presented for adoption.

This approach guided our contributions to the programs listed above and is being used by many more cities as a tool and resource. But clarity in approach and structure does not necessarily reflect unity in intent. What is clear is that cities adopt green programs for a variety of reasons, and the reasons are changing as perspectives on environmental issues evolve.

Santa Monica's program emerged from the City's commitment, starting in 1994, to promote sustainability locally. Looking at ways to reduce the ecological footprint, staff quickly identified the built environment as both a strategic entry point and a means to generate quantifiable benefits that could be folded into the long-term tracking of citywide performance through sustainability indicators. In other places, green building programs have served as the catalyst for stronger commitments to sustainability. Pasadena adopted the UN Environmental Accords partly as an outgrowth of its green building program and Long Beach recently established a Sustainable City Commission concurrent with preparing the green building ordinance. For other cities, programs stemmed from a long-term commitment to overall environmental stewardship, often driven by several committed senior staff members, planning commissioners, or city council members.

Recently though, the focus has shifted to green building programs as the cornerstone of climate action plans. Why the sudden change?

First, climate change has quickly moved up the list of critical issues in the minds of the public and policymakers. The June 2006 Parade Magazine cover story, "Why You Can't Ignore the Changing Climate," combined with the early 2007 release of the 4th Assessment Report from the International Panel on Climate Change[4] effectively ended the discussion, both public and scientific, of whether climate change was "real." As evidence of climate change grew, the urgency of the issue grew too. The issue at hand became determining what to do, quickly, to stabilize atmospheric carbon and maintain the climate close to what we have become accustomed to over the past 10,000 years.

For staff members and elected officials looking for local climate change mitigation strategies, turning to green building is a natural move. Nationally, buildings account for 39% of energy use, 68% of total electricity consumption, and 38% of carbon dioxide annually.[5] In California these numbers are slightly lower, the result of both the stringency and consistent implementation of the State energy code (Title 24, Part 6) over the past thirty years. Nonetheless, buildings remain one of the largest consumers of energy and contributors to climate change in the State.[6]

The second reason is the California Global Warming Solutions Act or AB 32. With the 2006 adoption of this landmark state policy, addressing climate change switched overnight from a voluntary undertaking of few progressive cities, to compliance with state law. The State Attorney General's Office quickly conveyed just how serious and fundamental a change was in the wind by challenging several jurisdictions' general plans on the grounds that they were deficient in addressing climate change.

In hammering out the settlement agreements, climate action plans are emerging as preferred strategy, with green building a core component in at least one instance.[7]

So, how effective are green buildings as a tool for stemming climate change?

Examining the projected benefits of the City of Los Angeles Green Building Program offers some insight into the actual value of a green building program in the effort to address climate change. The program, approved unanimously by the City Council and signed into law by Mayor Villaraigosa on Earth Day 2008, requires all building projects of 50,000 square feet or 50 residential units or greater to meet the intent of the US Green Building Council's LEED rating system at the Certified level. As a part of our assistance to the city in establishing the program, Global Green analyzed the energy, water, and construction waste savings and prepared an estimate of the avoided carbon emissions that would result from the approximately 150 projects estimated to be subject to the program annually.

The results show that the Los Angeles Program would yield approximately 5,500 tonnes of avoided emissions each year.[8] The Los Angeles Department of Water and Power's most recent submittal to the California Climate Registry provides a useful reference point. As the city's electricity and water provider, DWP reported 4,129,368 total tonnes of carbon dioxide emissions represent a large portion of the overall carbon footprint for Los Angeles.[9] In year one, the green building program would result in just a .13% reduction in overall emissions. Given the time and effort that went into creating the program this seems underwhelming.

Figure 4

But the picture changes, dramatically, as more buildings come on line. By year fifteen, the annual emissions reductions increase to 14%. This is because buildings that come on line in year one continue to generate energy and water savings in future years. As time goes by, the benefits of the green building program increase exponentially. Translated into quantities that are perhaps easier to grasp than "tonnes of avoided emissions", by the end of its fifteenth year the benefits of the Los Angeles program are equivalent to planting 14 million trees or removing 100,000 cars off the road permanently.

Figure 5

This analysis highlights that green building is a strategy for the long term. By focusing on new construction or major remodels, the number of green buildings and, by extension, the volume of benefits produced by the program over time become significant. Given short political and economic cycles and a general societal expectation for quick fixes and fast results, this long-term strategy may require greater patience than is typically expected or available. Climate change is a long-term problem and it will require long-term thinking and commitment to produce meaningful emission reductions. Given that the carbon footprint of a typical commercial or high-rise residential project will last for the at least 50 year life span of the building, our ability to capture efficiencies on a consistent basis becomes even more imperative.[10] To capture more benefits, sooner, the Los Angeles program could be augmented with requirements and incentives for energy and water retrofits of existing buildings. Still, new construction offers the greatest potential, with a recent study estimating a threefold benefit as compared to retrofits.[11]

Clearly, green building is only a part of the larger climate solution, not a panacea. Only by combining green building with thoughtful land use planning and provision of resource-efficient transportation options, can the built environment realize its full potential in helping to stem climate change. At deeper level, green buildings are components of a holistic, green urbanism strategy that links individual structures, efficient and appropriately scaled infrastructure, and healthy natural systems; to transform our cities over time to work with, instead of against, nature.

Which perhaps brings us back to sustainability - a mindset as much as a series of strategies and technologies. Green buildings, as microcosms of sustainability, show what can be achieved through focused effort, a spirit of collaboration and integration, and a commitment to work at a high level. If green buildings can change how we perceive the relationship between the built and natural environments and thus redefine we what we consider to be "business-as-usual," that may be the greatest value of all.

About the Author

Walker Wells, AICP, LEED AP, is the Green Urbanism Program Director at the Global Green USA, a national non-profit organization headquartered in Santa Monica. He works with affordable housing developers, municipalities, and school districts across the country to further green building and sustainable development practices by providing

technical assistance, conducting workshops, and developing public policy. Mr. Wells is an editor and a co-author of the 2007 book *Blueprint for Greening Affordable Housing* and the 2006 publication *Creating Successful Green Building Programs*.

Additional Resources

Global Green USA
http://www.globalgreen.org/greenurbanism

City of West Hollywood Green Building Program:
http://www.weho.org/index.cfm/fuseaction/DetailGroup/navid/53/cid/4493/

City of Los Angeles Green Building Program:
http://www.environmentla.org/greenbuilding/newgreenbuilding.htm

California Climate Action Registry
http://www.climateregistry.org

US Green Building Council/LEED Rating System
http://www.usgbc.org

Endnotes

1. Office of the California Attorney General, "Local Government Green Ordinances in California" Last Updated: 10/15/08
2. Environmental Law Institute, "Municipal Green Building Programs: Strategies for Transforming Building Practices in the Private Sector" April 2008.
3. Global Green USA, "Creating Successful Green Building Programs" 2006
4. Intergovernmental Panel on Climate Change, "Fourth Assessment Report, Working Group 1 Report: The Physical Science Basis" 2007.
5. U.S. Environmental Protection Agency, "Green Buildings: Why Build Green?" 2005.
6. The Climate Change Draft Scoping Plan prepared by the California Air Resources Board (June 2008) states that commercial and residential buildings account for 9% of the State's greenhouse gas emissions. In addition, buildings are the predominate user of electricity, which the Draft Scoping Plan identifies as accounting for a 23% of statewide GHG emissions.

7. State of California Office of the Attorney General, Memorandum of Agreement with City of Stockton, September 2008.

8. Global Green USA analysis, September 2008.

9. California Climate Action Registry, Los Angeles Department of Water and Power Annual Emission Report for 2005, February 2008.

10. California Environmental Associates, "Design to Win: Philanthropists Role in the Fight Against Global Warming" August 2007.

11. Ibid.